IRON AND STEEL INSTITUTE PAPERS

PAGE

"Sidney Gilchrist Thomas : A Commemorative Lecture," by J. Mitchell 1

"Optical Studies of the Oxidation of Iron at Temperatures in the Range 20–265° C.," by A. B. Winterbottom 9

"A Study of the Carburization Process with Special Reference to Gas Carburizing," by D. S. Laidler and J. Taylor 23

Historical Notes Nos. 21 and 22:

"A Rare Group of Wealden Firebacks," by H. R. Schubert 39

"An Iron Chain of 1252," by H. R. Schubert 40

Presidential Address:

"Iron Ore Resources and Open-Cast Operations in the Midland Orefield," by J. R. Menzies-Wilson 129

"The System Gehlenite–Spinel," by R. W. Nurse and N. Stutterheim 137

"Creep Testing by a Cantilever-Bending Method," by G. T. Harris and H. C. Child 139

"The Effect of Cold-Work on Steel," by J. H. Andrew and H. Lee 145

Section I—"Effect of Carbon on the Work-Hardening Properties of Steel," with P. L. Chang, B. Fang, and R. Guenot 146

Section II—"Effect of Cold-Work upon Electrical Resistivity in Steel," with P. L. Chang and R. Guenot 166

"Influence of Lead Additions on the Mechanical Properties and Machinability of Some Alloy Steels," by J. Woolman and A. Jacques 257

"The Corrosion of Steel in Estuarine Tropical Waters," by S. A. Main and T. H. Arnold 268

Historical Note No. 23:

"The Rise of the English Iron Industry between 1550 and 1650," by H. R. Schubert 278

"Forged Steel Rolls : A Review of their Application and Manufacture," by A. H. Waine 279

"The Effect of Cold-Work on Steel," by J. H. Andrew and H. Lee 369

Section III—"An X-Ray Investigation of Internal Strains in Cold-Drawn Steels," with P. E. Brookes 370

Section IV—"Effect of High-Speed Deformation on Steel," with L. Bourne 374

Section V—"An X-Ray Investigation of Structural Changes in Steel due to Cold-Working," by D. V. Wilson 376

Section VI—"Effect of Cold-Work on Hydrogen in Steel," with U. V. Bhat and H. K. Lloyd ... 382

Section VII—"General Discussion" 389

BRITISH IRON AND STEEL RESEARCH ASSOCIATION

PAGE

First Report of the Ingot Surface Defects Sub-Committee 41

"Thermodynamic Aspects of the Movement of Sulphur between Gas and Slag in the Basic Open-Hearth Process," by F. D. Richardson and G. Withers 66

"Corrosion Fatigue : The Influence of Disarrayed Metal," by D. Whitwham and U. R. Evans 72

"Studies in the Deoxidation of Iron : Deoxidation by Aluminium," by H. A. Sloman and E. L. Evans 81

"Gas-Pickling of Steel," by J. Pearson, W. Bullough, and T. C. Canning 185

"Determination of Tin in Highly Alloyed Steels," by the Methods of Analysis Committee 190

"The Reduction of Lump Ores," by R. Wild and H. L. Saunders 198

"Studies on Marine Fouling Organisms," by K. A. Pyefinch 214

"Pressure and Flow Distribution in a Model of a Venturi-Type Open-Hearth Furnace," by J. A. Leys and E. T. Leigh 301

"Ingot Heat Conservation : Mould and Ingot Surface Temperature Measurements," by A. V. Brancker 307

"Performance of Anti-Corrosive Compositions in Sea Water : Effect of Surface Preparation of Steel," by J. C. Hudson 314

"The Use of the Oxygen Lance in British Electric Furnace Practice" :

Part I—"The Use of Oxygen for the Production of Low-Carbon Alloy Steels other than High-Chrome Steels," by T. H. Harris and D. J. O. Brandt 400

Part II—"The Use of the Oxygen Lance in Stainless Steel Production," by W. H. Everard and D. J. O. Brandt 411

"Oil Burning : Tip-Atomizing Burners in the Open-Hearth Furnace," by A. L. Cude and J. R. Hall ... 419

"Determination of Silicon in Iron and Steel by an Absorptiometric Method," by the Methods of Analysis Committee 430

IRON AND STEEL WORKS ENGINEERING

"Lighting in Iron and Steel Works," by G. W. Levey 91

"Heating and Ventilation in the Iron and Steel Industry," by F. R. L. White 221

"The Supply and Distribution of Water to Iron and Steel Works," by J. L. Daniel 437

Report of the Eleventh Meeting (Morning Session):

Joint Discussion—"Electric Generation and Distribution in Iron and Steel Works," by T. Coxon, and "Protective Devices for Electrical Systems in Steelworks," by H. V. Benns and A. W. Tozer 335

Report of the Eleventh Meeting (Afternoon Session):

General Discussion—"The Layout of Integrated Iron and Steel Works," by H. H. Mardon and J. S. Terrington 96

News 99, 227, 342, 454

Translations 102, 231, 344, 461

Abstracts 103, 232, 345, 462

Book Notices 126, 255, 364, 470

New Publications 128, 256, 368, 472

ABBREVIATIONS AND SYMBOLS

Å.	Ångstrom unit(s) = 1×10^{-10} m.
A.C.	air-cooled ; alternating current
A.H.	air-hardened
amp.	ampère(s)
amp.hr.	ampère-hour(s)
approx.	approximately
at.-%	atomic per cent
at.wt.	atomic weight
atm.	atmosphere(s) (pressure)
A.W.G.	American wire-gauge
° Bé.	Baumé (degree)
b.h.p.	brake horse-power
B. & S.	Brown and Sharpe (gauge)
B.o.T.	Board of Trade
b.p.	boiling point
B.T.U.	Board of Trade unit(s)
B.Th.U.	British thermal unit(s)
B.W.G.	Birmingham wire-gauge
° C.	centigrade; Celsius (degree)
cal.	calorie(s)
c.c.	cubic centimetre(s)
c.d.	current density
c.g.s.	centimetre-gramme-second unit(s)
cm.	centimetre(s)
coeff.	coefficient(s)
conc.	concentrated
const.	constant(s)
cu.	cubic
cwt.	hundredweight(s)
D.C.	direct current
dia.	diameter
dil.	dilute
dm.	decimetre(s)
e.m.f.	electromotive force
e.v.	electron volt(s)
° F.	Fahrenheit (degree)
ft.	foot, feet
ft.lb.	foot-pound(s)
g.	gramme(s)
gal.	gallon(s)
H.F.	high-frequency
h.p.	horse-power
h.p.hr.	horse-power-hour(s)
hr.	hour(s)
in.	inch(es)
in.lb.	inch-pound(s)
I.S.W.G.	Imperial standard wire-gauge
° K.	absolute temperature (Kelvin scale)
kg.	kilogramme(s)
kg.cal.	kilogramme-calorie(s)
kg.m.	kilogramme-metre(s)
km.	kilometre(s)
kV.	kilovolt(s)
kVA.	kilovolt-ampère(s)
kW.	kilowatt(s)
kWh.	kilowatt-hour(s)
kX.	crystal Ångstrom(s) = 1000 Siegbahn X-units

l.	litre(s)
lb.	pound(s)
L.F.	low-frequency
M	molar (solution)
m.	metre(s)
m.amp.	milliampère(s)
max.	maximum
mg.	milligramme(s)
min.	minimum ; minute(s)
ml.	millilitre(s)
mm.	millimetre(s)
m.m.f.	magnetomotive force
m.p.	melting point
mV.	millivolt(s)
mμ	millimicron = 1×10^{-9} m. = 10 Å.
N	normal (solution)
N.T.P.	normal temperature and pressure
O.H.	open-hearth ; oil-hardened
O.Q.	oil-quenched
oz.	ounce(s)
p.d.	potential difference
*p*H	hydrogen-ion concentration
p.p.m.	parts per million
r.p.m.	revolutions per minute
sec.	second(s)
sp.gr.	specific gravity
sq.	square
S.W.G.	standard wire-gauge
T.	tempered
temp.	temperature
V.	volt(s)
VA.	volt-ampère(s)
W.	watt(s)
Wh.	watt-hour(s)
W.G.	water-gauge
W.Q.	water-quenched
wt.	weight
wt.-%	weight per cent
yd.	yard(s)
μ	micron(s) = 1×10^{-6} m.
μg	microgramme(s) = 1×10^{-6} g.
μμ	1 millionth micron = 1×10^{-12} m. = 0·01 Å.
Ω	ohm(s)
°	degree (arc or temperature)
′	minute of arc ; foot (feet)
″	second of arc ; inch(es)
$<$	less than
$>$	greater than
$\not<$	not less than
$\not>$	not greater than
$\leqslant$	equal to or less than
$\geqslant$	equal to or greater than
$\neq$	not equal to
$\equiv$	identically equal to
$\simeq$	approximately equal to
$\propto$	proportional to

Unless otherwise stated above, the symbols given in the following British Standards are used in the *Journal*: Chemical, Thermodynamical, and Physico-chemical quantities: B.S. 813; Engineering units: B.S. 560.

XUM

JAMES MITCHELL, C.B.E.

JAMES MITCHELL was born at Oban, Argyll. He received his technical education at the Royal Technical College, Glasgow, and from the staff of the Metallurgical Department he joined Messrs. Stewarts and Lloyds Limited in 1908. He was at first engaged on research work at their Clydesdale Iron and Steel Works and was later appointed Chief Chemist and Metallurgist. His responsibilities were then broadened to cover special research for other of the Company's works and, when the Central Research Department was set up, he became its first Head.

Appointed a Local Director of Messrs. Stewarts and Lloyds Limited in 1932, Mr. Mitchell was Director of Research in charge of the Bilston Iron and Steel Works of that Company. In 1939 he became Local Director in charge of Iron and Steel Works. His success in this sphere of operations led to his election to the Board in 1947 and to his present appointment as Managing Director of Iron and Steel Production. Although his activities as technical executive and administrator have absorbed much of his time in recent years, Mr. Mitchell has always retained an active interest in research. On the formation of the British Iron and Steel Research Association in 1945, he became Chairman of the Steelmaking Panel, acting in that capacity until 1949. He is the author of a number of papers concerned principally with Bessemer and rimming steels. The national importance of Mr. Mitchell's work in the iron and steel industry was recognized when, in 1949, he was awarded the C.B.E.

Mr. Mitchell became a Member of The Iron and Steel Institute in 1918, was elected a Member of Council in 1944, Vice-President in 1946, and Honorary Treasurer in 1949. He was awarded the Bessemer Gold Medal in 1950 for contributions to technical development in the iron and steel industry. Last month he delivered a Special Commemorative Lecture, arranged by The Iron and Steel Institute, to mark the Centenary of the birth of Sidney Gilchrist Thomas on 16th April, 1850. Mr. Mitchell is also a Founder Fellow of the Institution of Metallurgists.

XUM

Elliott and Fry

James Mitchell, C.B.E.

Honorary Treasurer